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PATENT SPECIFICATION

565,070



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COMPLETE SPECIFICATION

Improvements in or relating to Arch Supports or Inserts for Shoes or similar articles of Footwear

I, WILLIAM MATHIAS SCHOLL, a citizen of the United States of America, of 211 West Schiller Street, Chicago, State of Illinois, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This invention relates to improvements in arch supports of the character inserted in a shoe or other article of footwear, and particularly to such arch supports to be inserted on top of the insole and beneath the foot of the wearer to aid in the correction of deformities, injuries, or weakness of the foot.

In accordance with the present invention, the improved one-piece bowed foot conforming arch support or insert for shoes or other articles of footwear is formed of resilient sheet material, especially thermoplastic material, of substantially uniform thickness and shaped with a longitudinal arch for supporting the longitudinal arch of the foot, a transverse arch in the forward part of the arch support for supporting the metatarsal arch of the foot, a depression in the rear part of the arch support for receiving the heel of the foot, and an upturned margin or flange extending around one side, the heel, and all or part of the other side of the arch support.

85 In the past, arch supports for disposition beneath the plantar surface of a foot have as a rule embodied a resilient metallic plate or the like of such a configuration as to give the desired or needed corrective support in the proper region of the foot. Such arch supports have been fabricated to predetermined shapes and sizes, and fitting of individual feet has been accomplished by selecting from 40 stock the arch support having the shape and size closest to that desired. Since weakened or deformed feet vary in shape much more than normal feet, and since deformed feet may need support in any one or several of a number of localities, it is evident that even when fitting may be done from a large stock, thoroughly satisfactory fitting of an individual foot is not

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often accomplished. Fitting of conventional arch supports is further complicated by the fact that the opaqueness of conventional arch supports limits the fitter to whatever guidance is furnished by the tactile sense of the wearer which often is quite dull.

The present invention provides arch supports fabricated from thermoplastic material that can be molded or otherwise formed to fit individual feet. More particularly, the invention provides what may be called "arch support blanks" shaped generally as conventional arch supports that may be heated gently at any desired locality to make possible further molding or forming as required by the needs of each individual foot. The present invention additionally provides transparent arch supports, so that fitting may be guided by visual observation.

It is therefore an important object of the present invention to provide arch supports that may be fitted to individual feet more perfectly and with greater ease than are conventional arch supports.

A specific object of the invention is to provide transparent arch supports that may be molded or formed to the form of the foot being fitted at the retail store where the arch supports are fitted to individual customers.

Among the thermoplastic and optionally transparent materials that may be used in fabricating the arch supports of this invention may be mentioned, in particular, thermoplastic resins such as polymerized vinyl acetates, chlorides, and other vinyl esters softening at between 140° to 150° F.; vinylidene chloride resins softening at 150° to 200° F.; acrylic resins on the order of methyl methacrylate resins softening at 125° to 160° F.; styrene resins softening at 170° to 180° F.; ethyl and other ethers of cellulose softening at 130° to 150° F.; cellulose acetate softening at 122° to 200° F.; and cellulose acetate butyrate softening at 136° to 200° F.

Illustrative examples of arch supports according to this invention are shown in the accompanying drawing, in which:

Figure 1 shows a plan view of one arch

support according to this invention;

Figure 2 is a vertical longitudinal section along the line II—II of Figure 1;

Figure 3 is a vertical transverse section along the line III—III of Figure 1;

Figure 4 shows a plan view of another arch support according to this invention;

Figure 5 is a vertical longitudinal section along the line V—V of Figure 4; and

Figure 6 is a vertical transverse section along the line VI—VI of Figure 4.

In Figures 1 to 3, the reference numeral 10 indicates generally a transparent arch support fashioned from cellulose acetate butyrate. The arch support 10 takes the form of sheet bowed longitudinally at 11 to lend support to the longitudinal arch of the foot. At its rear portion, the arch support 10 is provided with a hollow or indentation 12 for the reception of the heel of the foot and the arch support is transversely bowed or arched in the forward portion thereof, as indicated at 13, to lend support to the metatarsal arch of the foot. An upturned margin 14 runs around all but the forward edge of the arch support. This support, on being inserted in a shoe or other article of footwear beneath the plantar region of the foot, will support both the metatarsal and the longitudinal arches of the foot, as well as the soft tissues thereabout and around the heel accommodated in the rear hollow of the arch support. Supporting the soft tissues is the special function of the upturned margin 14. At the same time, the upturned margin adds considerable strength and rigidity to the arch support.

Translucent or opaque cellulose acetate butyrate may also be employed to form the arch support.

A strip of fabric 15 may be attached to the under side of the front margin to eliminate squeaking and forward displacement of the arch support by slipping or otherwise.

The arch support 20 of Figures 4 to 6 is generally similar to that of Figures 1 to 3, being formed with a longitudinal arch 21, a heel depression 22, and a transverse arch 23.

However, the upturned margin 24 of the arch support of Figures 4 to 6 extends, on the outside only, along the heel portion of the arch support up to the middle portion of the longitudinal arch or adjacent the cuboid foot bone. Elimination of the outside fore portion of the upturned margin prevents irritation of especially sensitive feet.

Such arch supports may be fabricated by molding sheets of thermoplastic material, by injection molding in permanent molds, or by other methods well known in the art.

While the arch supports of this invention preferably are transparent, opaque and optionally tinted arch supports made from thermoplastic material are within the scope of the invention.

When the arch supports of this invention are fitted to individual feet, non-conformities in shape may readily be detected by visual observation through the transparent arch supports and corrected by gently heating and then forming the locations needing correction in form. As disclosed in applicant's co-pending application No. 4855/43 (Serial No. 565,071) such heating may be effected by directing a current of warm or hot air against the area on the arch support to be formed, for instance, by means of an open-ended hollow cylinder or tube containing a heating element and covered at one end by a replaceable mask with an aperture matching the area to be heated. Such a tube may be supported vertically above a flat surface by means of a stand or legs attached to the tube, to allow air free ingress at the bottom of the tube, the top being covered by said mask over which the arch support is laid. A mask having any desired form and size of aperture can be provided to permit heating and softening of any desired area of the arch support.

Radiant heat can also be utilized for accomplishing this end. Suitable electrical devices capable of generating radiant heat or infra-red heating rays may be disposed within a tube having an open-ended top covered with an apertured mask, as explained hereinabove. Forming or molding of heated and softened areas can be effected manually or by means of suitable tools.

The articles of this invention may be denominated arch support blanks, being configured to general conformity with a human foot and adapted for forming into fitting relationship with any individual foot. Since gentle heating suffices to soften the blanks for localized forming when fitting, such fitting may be done in retail stores. The present invention thus makes generally available for the first time, as far as applicant knows, an arch support that is exactly shaped to the requirements of any individual foot.

Rapid fitting of individual feet may be effected by providing a stock of arch support blanks including arch support blanks having, say, three different elevations and three different widths in each

size. A blank can be selected from such a stock that will only require relatively minor form fitting adjustments as compared with the case when it is attempted to fit any and all feet from a single standard arch support blank. Final adjustment in the form of the arch support for the peculiar abnormalities in the form of individual feet can be usually made without changing the general form or shape of the arch support.

Many details of form and structure may be varied within a wide range without departing from the principles of this invention, and it is therefore not my purpose to limit the patent granted on this invention otherwise than necessitated by the scope of the appended claims.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A one-piece bowed foot conforming arch support or insert for shoes or other articles of footwear, said arch support or insert being formed of resilient sheet material, especially thermoplastic material, of substantially uniform thickness and shaped with a longitudinal arch for supporting the longitudinal arch of the foot, a transverse arch in the forward part of the arch support for supporting the metatarsal arch of the foot, a depression in the rear part of the arch support for receiving the heel of the foot, and an upturned margin or flange extending around one side, the heel, and all or part of the other side of the arch support.

2. An arch support or insert according to claim 1, wherein said upturned margin or flange extends around all but the forward edge of the arch support for supporting the soft tissues of the foot.

3. An arch support or insert according to claim 1 or 2, having a depressed heel seating portion, an elevated portion for supporting the longitudinal arch of the foot and a continuous upturned flange

commencing at the inner forward end and extending around the heel part to a point adjacent the cuboid foot bone and having a terminal portion tapering toward the outer forward end of the arch support.

4. An arch support or insert according to claim 1, 2 or 3, having a recess for the heel together with a continuous upturned edge or flange extending rearwardly from the forward end of the inner arch support margin as a support for the inner longitudinal arch of the foot, extending around the heel to provide support for the os calcis, thence extending forwardly as a reinforcement or stiffener for the outer longitudinal arch portion of the arch support, and having a terminal portion extending toward the outer forward end of the arch support.

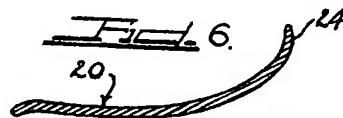
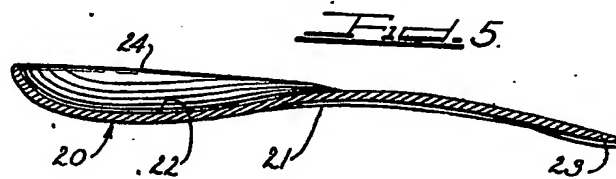
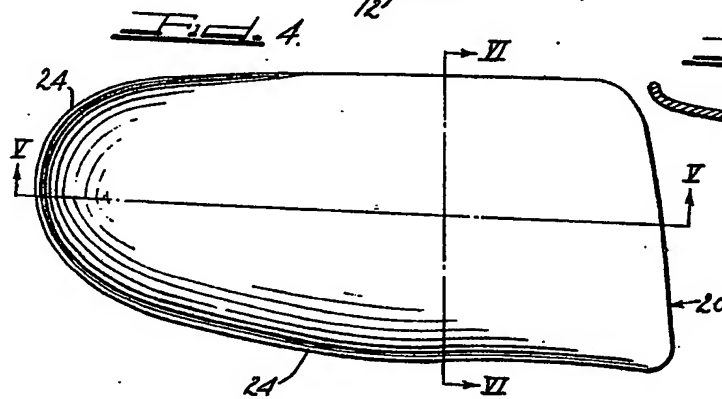
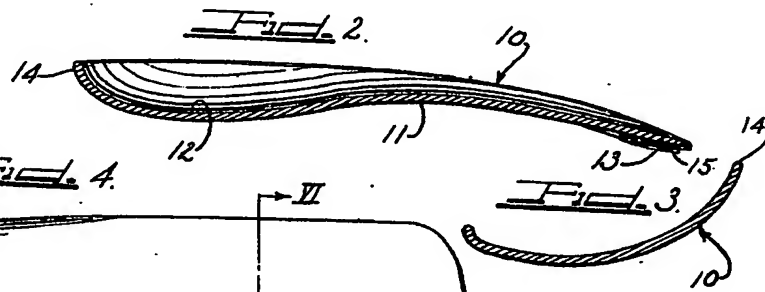
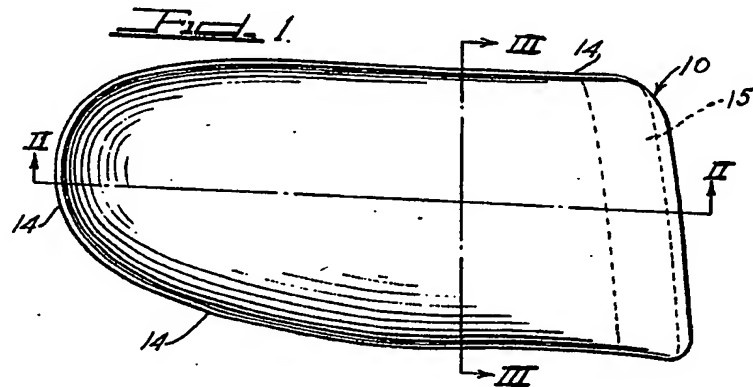
5. An arch support or insert according to any of the preceding claims in which said support or insert is formed or fabricated from thermoplastic material, for example a thermoplastic resin.

6. In an arch support or insert according to any of the preceding claims, said arch support or insert being fabricated from a thermoplastic resin with a transverse leading margin back of the phalanges of the foot to be supported and normally tending to squeak and slide when worn inside a shoe, the improvement comprising a strip of fabric attached to the under side of said transverse leading margin, whereby sliding and squeaking is prevented.

7. An arch support or insert for shoes or other articles of footwear having its parts constructed substantially as herein described with reference to the accompanying drawing.

Dated this 25th day of March, 1943.
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[This Drawing is a reproduction of the Original on a reduced scale.]



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